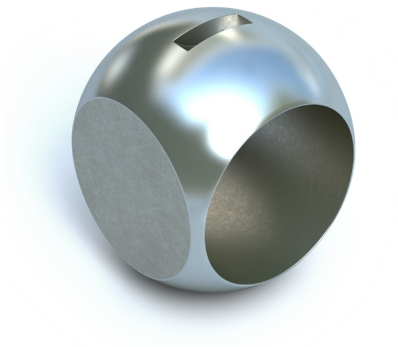
Unique Resolute Ball™ Design Provides Reliable Service in Pulp & Paper Application

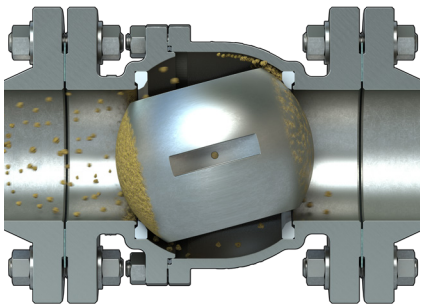
KEY RESULTS

- Media scaling on upstream side of ball was greatly reduced.
- Ability to flush media from the ball, seats, and body cavity provided reliable, long-term operation.
- Valve service life of 7+ years, with no repairs required.
- Estimated annual cost savings[1] of **$83,600**.



CALCIFYING MEDIA CHALLENGES

Within pulp & paper plants, calcifying media applications (such as green and white liquor lines) cause media buildup on traditional valves, when in the closed position — causing them to leak prematurely, become inoperable, or even experience stem twist or shear.

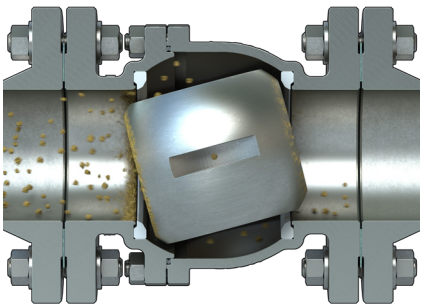


TRADITIONAL ROUND BALL

Large spherical surface area allows media buildup on ball surface and downstream ball cavity.

Media buildup leads to seat damage and increased torque, due to constant contact between ball and seat during full 90° rotation.

High valve torque is required to break significant media buildup. Valve seats could leak prematurely, valve could fail to operate, or stem could twist and/or shear.



UNIQUE RESOLUTE BALL™

Modified ball design minimizes effects of media buildup on ball sealing surface and allows particles to flow through ball cavity.

Seat life is extended by eliminating contact between ball and seat after 10° of rotation.

Reduced valve torque is required to break minimal media buildup. Valve easily operates with standard actuation.

APPLICATION DETAILS

Customer	Large pulp & paper mill in southern United States.
Process	Pulp & paper.
Application	Market pulp (kraft pulp) milling. (Isolation)
Media	White and green liquor.
Operating Temperatures	302°F to 338°F 150°C to 170°C
Unique Performance Requirements	Tight shutoff; Reduced ball-to-seat drag; Low operating torque; Easy opening after dormant periods; Long service life.

> To learn more about the customer challenges and Bray's solution, continue reading on page 2.

CHALLENGE

In this application for green and white liquor isolation, competitor ball valves were experiencing frequent failures caused by calcified media buildup. Upstream media buildup was leading to scoring of the seat and ball during operation, causing the valves to leak prematurely. In addition, severe buildup was causing higher valve torques — resulting in failure to operate. With failures occurring after only 2 months in service, the shutdowns and repairs were becoming very costly to operations.

After 2 months in service, a competitor's valve showed signs of upstream severe media buildup — causing frequent leaks and lockups.

SOLUTION

The Resolute Ball™ design was developed by working closely with the customer to understand and overcome the challenges of their application. The ball was designed as a direct replacement for standard balls within select Flow-Tek Valves. Media contact with the seat is minimized throughout the quarter-turn operation, while the modified ball geometry allows for media particles to be flushed past the ball and seats. This unique design provides improved operability, extended service life, reduced valve operating torque, increased reliability, and reduced total cost of ownership for the customer.

For this application, 4 valves were initially ordered to replace competitor products in the white and green liquor service lines. The ball was installed in Flow-Tek Series RF15, reduced port, flanged 1-piece ball valves for evaluation.

BRAY PRODUCT DETAILS

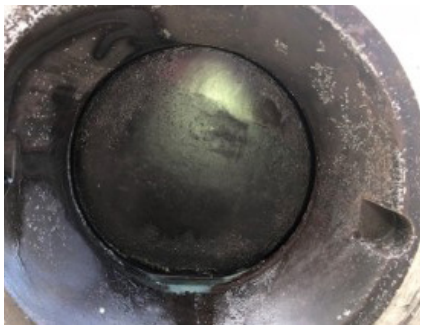
Valve	Flow-Tek RF15; 1-piece, floating ball, flanged valve.
Size	NPS 4, 6, 8, 10 DN 100, 150, 200, 250
Pressure Class	ASME 150 | PN 10, 16
Materials	SS body and trim; Customized seat materials; 17-4 PH stem.
Modifications	Resolute Ball™ design.

RESULTS

After installing the 4 valves, they continued in service for 18 months, until they were removed for evaluation during a scheduled plant maintenance shutdown. The valves had no leaks and showed no signs of wear, so they were reinstalled. The customer was so impressed with the results that they ordered 18 more valves for isolation service, ranging in size from NPS 4 to 10 (DN 100 to 250). The 22 valves are stroked monthly to flush the media, and have continued in service for more than 4 years with no issues.

Customer benefits include:

- Estimated annual cost savings[1] of **$83,600**, or 7-year savings of **$585,200**.
- Service life was greatly extended with no replacement or repair required to date.
- Scaling of media on the upstream side of the ball was greatly reduced.
- Ability to flush media from the ball, seats, and body cavity has prevented the valves from prematurely leaking or failing to operate.



After 18 months in service with no issues, the valve showed no signs of wear or upstream media buildup.

NOTES:

1 Based on 22 valves total. Does not include labor to remove and install valves. Does not include chemical costs from draining vessels for pump repair, when they cannot be isolated safely, due to a leaking isolation valve.